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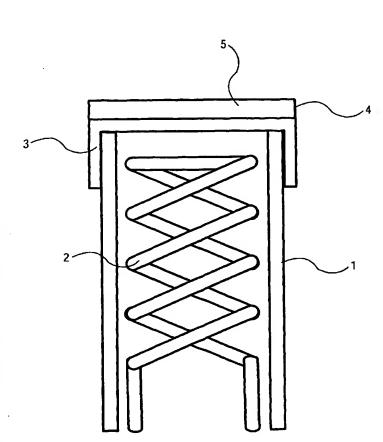
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[Continued on next page]

(54) Title: VACUUM TUBE WITH OXIDE CATHODE



(57) Abstract: A vacuum tube, in particular a cathode ray tube, equipped with at least one oxide cathode comprising a cathode carrier (1) with a cathode base (3) of a cathode metal and a cathode body (4) with a cathode coating (5) of an electron-emitting material that comprises an alkaline earth oxide, selected from the group formed by the oxides of calcium, strontium and 5 barium, and a sintering inhibitor.





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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) $IPC\ 7\ H01J$

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Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

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O-4		a salayant nagaga	Delevent to delm No.		
Category °	Citation of document, with Indication, where appropriate, of th	Relevant to claim No.			
X	US 5 708 321 A (JOO KYU-NAM E	1,2,5,6,			
•	13 January 1998 (1998-01-13)	9			
	abstract; claims 1-3; figures	1,2			
	column 3, line 10 - line 63		5 0		
Y	column 2, line 39 - line 55	5–8			
X	EP 0 373 701 A (PHILIPS NV)	1-3,7,9			
	20 June 1990 (1990-06-20)				
	the whole document				
Х	EP 0 841 676 A (MATSUSHITA ELE	1,2,9			
^	CORP) 13 May 1998 (1998-05-13)	1,2,5			
	abstract; figure 3				
	column 2, line 57 - column 3,				
	column 5, line 25 - column 6,				
	column 9, line 30 - column 10,				
		-/			
		•			
X Fur	ther documents are listed in the continuation of box C.	Patent family members are listed	in annex.		
° Special c	ategories of cited documents :	"T" later document published after the inte	emational filing date		
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	means nent published prior to the international filing date but	ments, such combination being obvious in the art.	ous to a person skilled		
later	than the priority date claimed	<u> </u>	*& document member of the same patent family		
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INTER IONAL SEARCH REPORT

tional Application No T/IB 03/05180

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Category °	citation) DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
		104	
A	EP 0 635 860 A (THORN MICROWAVE DEVICES LIMITE) 25 January 1995 (1995-01-25) abstract; figure 1 column 1, line 1 - column 2, line 39	1,2,4	
Y	DE 100 45 406 A (PHILIPS CORP INTELLECTUAL PTY) 28 March 2002 (2002-03-28) cited in the application abstract; figure 1 paragraph '0010!	5-8	
		.,	
٠			

INTERNATIONAL SEARCH REPORT

mal Application No

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5708321	A	13-01-1998	CN	1149753 A ,B	14-05-1997
			DE	19618929 A1	07-05-1997
			GB	2306764 A ,B	07-05-1997
			JP	2928155 B2	03-08-1999
			JP	9129118 A	16-05-1997
		•	NL	1003086 C2	14-05-1998
			NL	1003086 A1	02-05-1997
 EP 0373701	A	20-06-1990	NL	8803047 A	02-07-1990
			CN	1043585 A	04-07-1990
			DE	68922378 D1	01-06-1995
			DE	68922378 T2	21-12-1995
			EP	0373701 A1	20-06-1990
			JP	2195628 A	02-08-1990
			JP	3152422 B2	03-04-2001
			KR	154521 B1	15-10-1998
			US	5059856 A	22-10-1991
EP 0841676	A	13-05-1998	JP	10144201 A	29-05-1998
•			JP	10144202 A	29-05-1998
			CA	2220537 A1	12-05-1998
			CN	1189680 A ,B	05-08-1998
			DE	69719452 D1	10-04-2003
			DE	69719452 T2	02-10-2003
			EP	0841676 A1	13-05-1998
			NO	975206 A	13-05-1998
			US	5925976 A	20-07-1999
EP 0635860	A	25-01-1995	GB	2279495 A	04-01-1995
			EP	0635860 A1	25-01-1995
			US	5507675 A	16-04-1996
DE 10045406	Α	28-03-2002	DE	10045406 A1	28-03-2002
			CN	1342988 A	03-04-2002
			EP	1189253 A1	20-03-2002
			JP	2002140999 A	17-05-2002
			US	2002070651 A1	13-06-2002